Motivating questions for science planning

- **What are the important information gaps to address?**
- **What are the best approaches for addressing those information gaps?**
- **What mix of research, over what time period, will be most useful to NPLCC partners?**

Steps in developing a science strategy

- **Identify potential science & information needs**
  - Should be driven by the decision-support needs of NPLCC partners

- **Define Science Strategy objectives and different portfolio philosophies**
  - Alternative ways to meet the strategy objectives

- **Evaluate (prioritize) the identified science and information gaps / needs**
  - Based primarily(?) on decision-relevance criteria (to be developed)
- **Develop and evaluate science strategies**
  - Considering high-value S&I needs, SS objectives, and alternative portfolio philosophies

- **Implement the Science Strategy (via an annual planning process?)**
  - Develop / solicit projects or activities to address elements of the overall strategy
  - Evaluate and select projects

Key concepts: identifying science and information needs

- **Identification of potential needs should be driven by:**
  - Management questions facing NPLCC partners
    - ***What conservation and sustainable resource management decisions do they make?***
  - Objectives or "outcomes of interest" to those partners when making such decisions
    - ***What types of outcomes would they like to know or predict prior to making decisions?***
- **Need to consider what information is already available or being developed; NPLCC can focus on**
  - Unmet needs
  - Increasing accessibility of information already available

Today's discussion topics

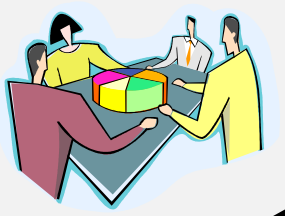
Partner / customer decisions

Ongoing activities are generating lists of potential needs

End-users decisions and outcomes of interest should drive NPLCC priorities

End users of science (resource managers)

NPLCC



LCC priority information needs

Proposed projects or activities

Decisions about LCC priorities and activities

Process for evaluating importance of information needs

Science Strategy is one means for achieving NPLCC objectives

NPLCC Mission

- **The North Pacific Landscape Conservation Cooperative promotes development, coordination and dissemination of science to inform landscape level conservation and sustainable resource management in the face of a changing climate and related stressors.**

Framing workshop review

- **Identify and describe:**
  - Decision-makers and stakeholders
  - Range of decisions each group might make, and assumptions bounding those decisions
  - Key objectives (outcomes of interest) for various decision-makers and stakeholders
    - ***Potential metrics for measuring performance against those objectives***
  - A few specific decisions/alternatives that should be evaluated
  - Critical information (science) needed to evaluate how decisions will affect objectives

Examples of decisions (potentially) supported by the NPLCC

Land acquisition of sensitive areas

Ellsworth Creek Preserve

Restoring a Low Elevation Coastal Rainforest in Southwest Washington

Download Ellsworth Creek Baseline Monitoring GIS Data

Ellsworth Creek is a small coastal watershed comprised of coniferous forests, a freshwater stream system, and large estuary. The watershed is located within the Sitka spruce forest zone and contains several small patches of old-growth forest. These remnants are some of the largest remaining old growth forest stands left within the Willapa Bay region of southwest Washington and contain five distinct natural forest community types. The Conservancy acquired the Ellsworth Creek Preserve to conserve and restore a highly productive and biologically diverse coastal temperate forest ecosystem in an area of the Pacific Northwest Coast that has been managed almost exclusively for timber production. Our science is helping advance forest restoration throughout the Pacific Northwest coast.

Species recovery plans

Summary: types of decisions the NPLCC supports

- Mitigation, restoration, and loss compensation decisions (where, how, when)
- Identification and prioritization of areas & species for conservation
- Land use and land management (allowable activities & management of those activities)
- Water allocation, use, and management
- Species management
- Decisions about cultural and historic resources
- Private investment and development decisions
- Decisions about the use of natural resources
- Regulations and legislation
- Allocation of agency or entity resources
- Where and how to monitor for environmental changes
- Decisions about information and knowledge governance
- Decisions about education / outreach (where, when, and how)
- Decisions about standing, tribal sovereignty
- Decisions about control of and response to infectious (human) diseases
- Decisions about climate change prevention

Example: additional detail on decisions

Decision types, example decisions	Some relevant decision-makers
Land use decisions / decisions about allowable activities E.g., Land use designation (areas of critical environmental concern) Location & establishment of parks, conservancies, other areas for protection Constraints on planned uses or activities Zoning, etc – affecting where and how growth happens Permitting of various activities on the landscape Wetland easement terms (and terms of any easement?)	Numerous, including: Environmental Assessment decision-makers, State agencies and counties, Aboriginal decision-makers, Tribal Councils, BLM, Joint Ventures, Provincial Cabinet Subcommittee, State Fish and Game planners, NRCS, NGOs

Discussion

- **Are there additional end-user / partner decisions that NPLCC science and information should be designed to support?**
  - Your input
  - Are there other entities we should bring into this review/expansion of decision types?
    - ***How and when can we do that?***
  - Seek additional review / input from the Steering Committee?
- **Need a reasonably robust list by May 8th call**
  - Please provide any additional input based on your review of the framing list & this discussion to Mary and Karen by May 1

Objectives for End-User Decision Makers (outcomes of interest)

What is an outcome of interest?

- **Definition:**
  - An outcome of interest or decision-maker objective states what it's (un)desirable to achieve through an ***object of value***, ***a direction of preference***, and a ***context*** of alternatives or options

- **Examples:**
  - ***Minimize health impacts*** due to air pollution in Los Angeles
  - ***Maximize species health and abundance*** of species X (specific fish and wildlife species)
  - ***Maximize profits*** from a business
  - ***Minimize political fallout*** from public policy choices

What is NOT an outcome of interest or objective?

- **This sounds like an objective…**

  "My objective is to perform restoration work on key habitat site X."

  Or

  "My objective is to set up a monitoring network for lynx populations populations in the PNW."

  – Performing restoration work or monitoring is a **Decision,** that is likely intended to achieve something else that is of fundamental value to the decision maker (i.e. a fundamental objective)

Summary: Outcomes of interest to NPLCC customers

- **Habitat quality and species population health (for species of management interest)**
- **Ecosystem function and services**
- **Water quality and availability**
- **Economic benefits from the environment**
- **Human health and security**
- **Preservation of cultural resources**
- **GHG emissions and CO2 concentration in atmosphere**
- **Ability of tribes to exercise treaty rights**
- **Quality of decision making**
- **Level of knowledge of landowners & the public about climate change, its impacts, and wise use**
- **Diversity of groups involved with coordinated climate change decision making**
- **Global recognition of excellence in sustainable resource management and economic development**

Objectives for End-Users (details)

Maximize habitat quality and species population health

- Maximize habitat quantity and quality for
  - Habitat permanently conserved for birds during all life cycles
  - Oceans
  - Old growth forests
  - Designated wetlands
  - Habitat for rare and endemic species
- Maximize quality of near-shore function/habitat/resilience to sea level rise
- Minimize harm to species , minimize species extinctions
- Maximize health of federal species at risk and allow to thrive without intervention
- Minimize number of depleted fish populations, maximize productivity of fisheries
- Maximize species biodiversity (in situ)

Discussion

- **Are there additional objectives or outcomes of interest relevant to NPLCC partners and their decisions?**
  - Your input
  - Are there other entities we should bring into this review/expansion of decision types?
    - ***How and when can we do that?***
  - Seek additional review / input from the Steering Committee?
- **Need a reasonably robust list by May 8th call**
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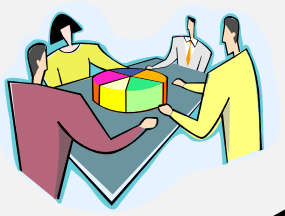
Today's discussion topics

Ongoing activities are generating lists of potential needs

End-users decisions and outcomes of interest should drive NPLCC priorities

End users of science (resource managers)

NPLCC



LCC priority information needs

Proposed projects or activities

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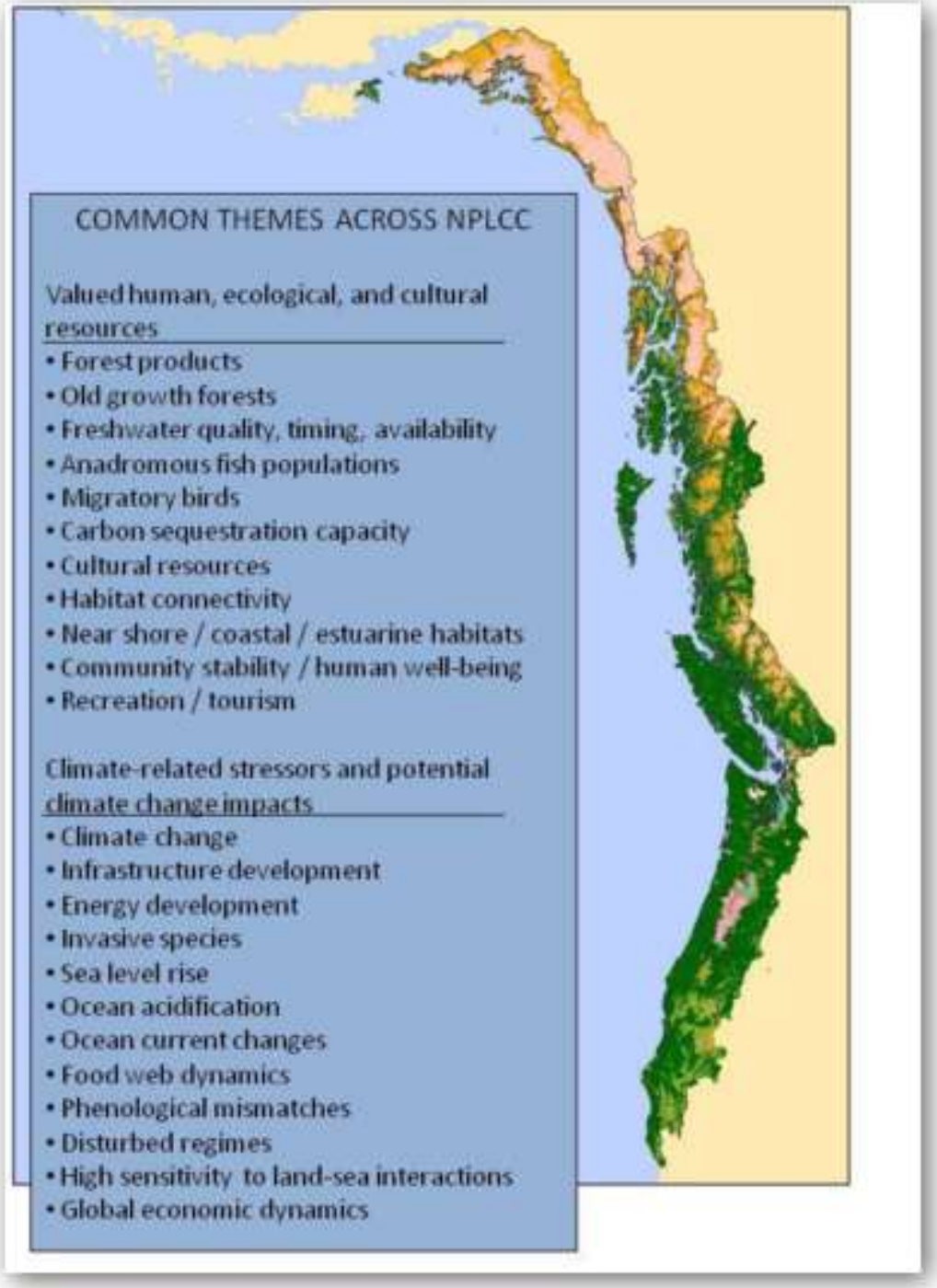
Science Plan is one means for achieving NPLCC objectives

Approaches for identifying (possible) information needs

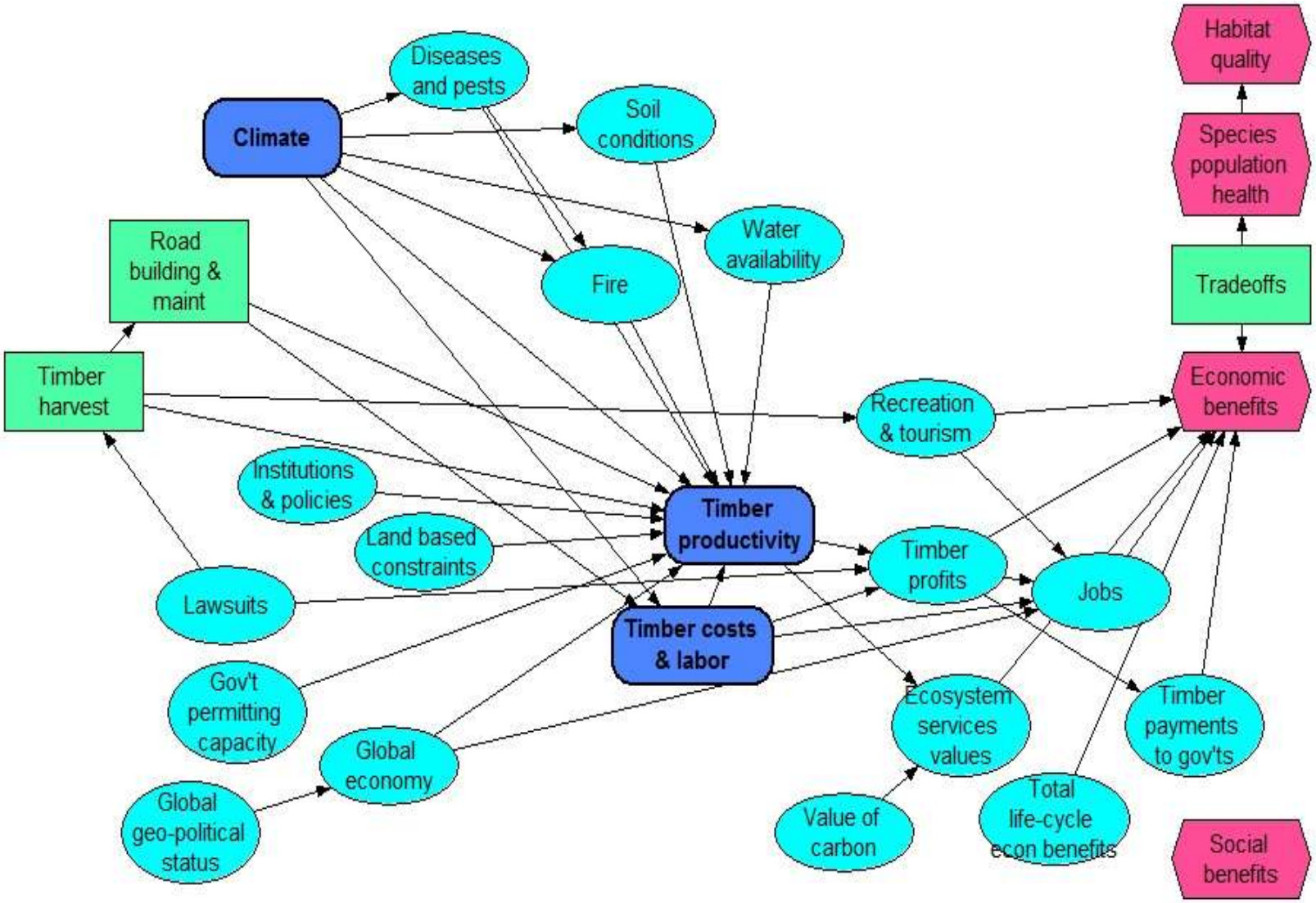
- **Development of biogeophysical models, including extraction of common themes**
- **Decision-focused conceptual models to identify critical uncertainties**
- **Brain-stormed list of information needs**
- **Surveys / discussions with stakeholders**
- **NWF activities**
- **Other approaches being used elsewhere**
  - Large LCC-wide Science Workshop (e.g., W. Alaska LCC)
  - Survey or compile a list from partner agencies (e.g., Appalachian LCC, Pacific Islands CCC)

To provide effective decision support, it is critical that information "needs" be connected to decisions and to outcomes of interest

- **Example: common themes from biogeophysical models**



Example: decision-focused conceptual models



Example: brainstorming

Relevant decision(s)	Uncertainty (Information/Science Need)	Outcome(s) of interest
• **Education and outreach**	• Current public perceptions; effectiveness of different communication strategies	• Maximize public awareness and education
• **Restoration and mitigation decisions; nearshore**	• Effect of changes in ocean and near-shore water conditions (e.g., temperature, currents, level on the lifecycle of fish and other animal species	• Maximize habitat quality and species population health
• **Land management / forest management** • **Species management** • **Restoration and mitigation decisions**	• Effect of habitat fragmentation on species population health	• Maximize habitat quality and species population health

Example: focus groups

Early results: Web-based focus groups

- NPLCC Regional Commonalities
  1. Science Needs for Marine and Freshwater Ecosystems
  2. Need for tools
  3. Need to better coordinate information sharing and knowledge exchange
  4. Need to better facilitate cross-boundary and cross-organizational collaboration
  5. Need for improved outreach and education with public and decision makers
- NPLCC Sub-Regional Differences
  1. Need to assess impact of hydropower projects on FW systems in BC and AK
  2. Focus of work in BC and Strait of Juan de Fuca is more municipal and local *versus* federal and state elsewhere
  3. Contrast between quantity and quality of data for California Current Region's marine and freshwater systems

S/TEK challenges – Science Strategy

- **Identify a comprehensive set of potential information needs**
  - Include perspectives of all NPLCC partners
  - Focus on *unmet* needs
- **Discussion questions:**
  - Other approaches or efforts you are aware of?
  - Are there types of information needs we might be missing?
  - How can we coordinate / consolidate the results of these different efforts

Today's discussion topics

Ongoing activities are generating lists of potential needs

End-users decisions and outcomes of interest should drive NPLCC priorities

End users of science (resource managers)

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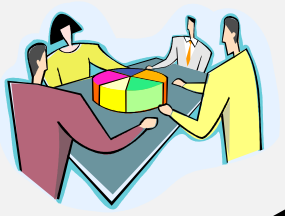

LCC priority information needs

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Goals of the Science Strategy?

NPLCC Mission & Goals

- **Mission: The North Pacific Landscape Conservation Cooperative promotes development, coordination and dissemination of science to inform landscape level conservation and sustainable resource management in the face of a changing climate and related stressors.**
- **Goals (all in the context of the mission statement):**
  - Maximize the ability of partners to make informed decisions
  - Identify and address trans-boundary landscape-level information needs that the LCC is uniquely qualified to address
  - Identify priorities for applied science and other information
  - Promote identification, use, and sharing of science, traditional knowledge and other relevant information
  - Maximize the availability and accessibility of data and information
  - Promote coordination and efficiency of efforts among partners
  - Promote awareness and understanding of NPLCC and its products

Discussion

- **Goals for the science strategy?**

Schedule and upcoming meetings

- **Identify potential science & information needs**

Continued discussion and activity through July meeting

- **Define Science Strategy objectives and different portfolio philosophies**

Continued discussion and activity through July meeting

- **Evaluate (prioritize) the identified science and information gaps / needs**

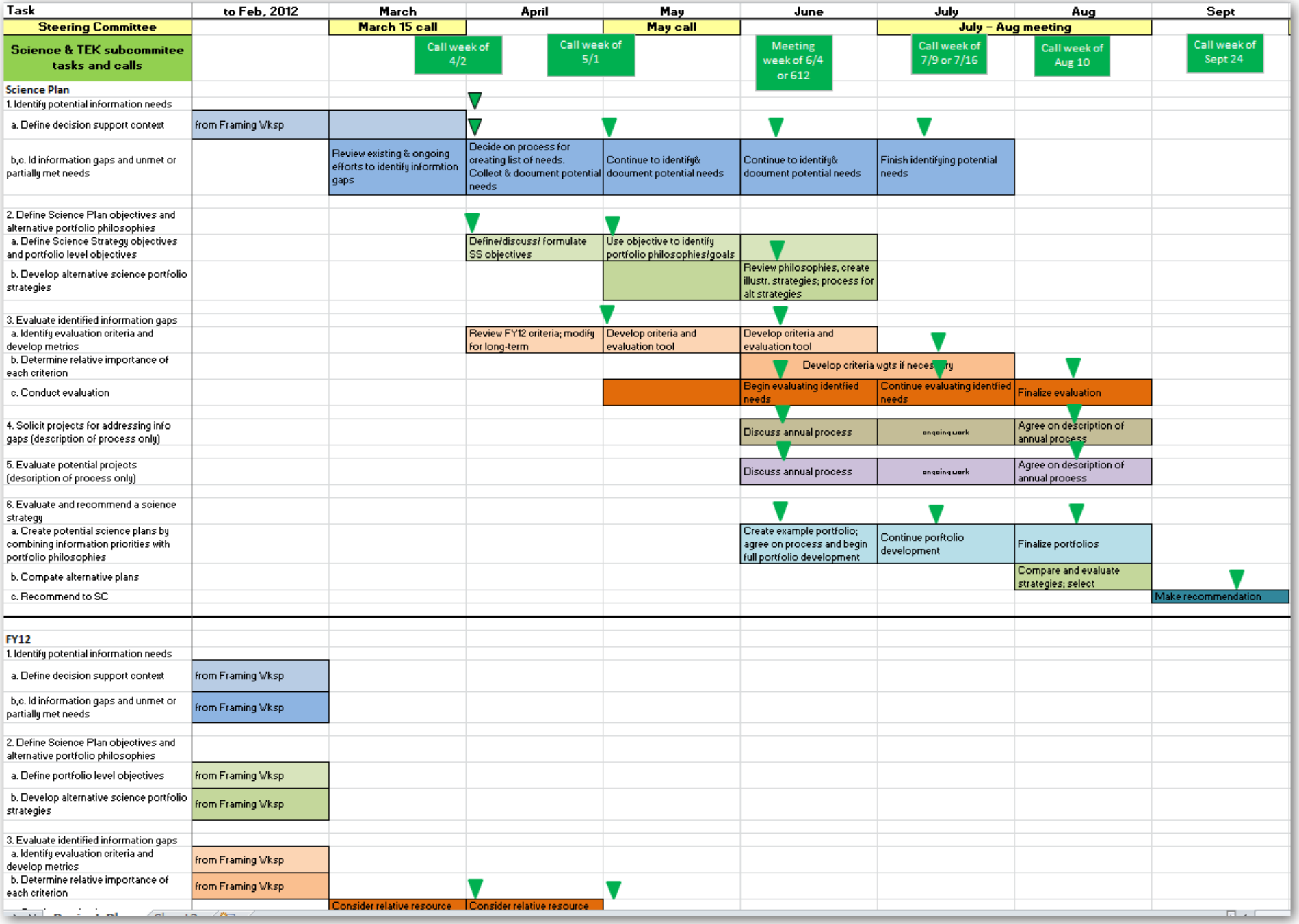
Initiate evaluation by June meeting, continue through Aug

- **Develop and evaluate science strategies**

Initiate evaluation by June meeting, continue through Aug

- **Implement the Science Strategy (via an annual planning process?)**

Initial definition of process during June meeting, Develop and document through Aug


Task
to Feb, 2012
March
April
May
June
July
Aug
Sept
Steering Committee
March 15 call
May call
July – Aug meeting
Science & TEK subcommitee tasks and calls
Call week of 4/2
Call week of 5/1
Meeting week of 6/4 or 612
Call week of 7/9 or 7/16
Call week of Aug 10
Call week of Sept 24
Science Plan
1. Identify potential information needs
a. Define decision support context
from Framing Wksp
b,c. Id information gaps and unmet or partially met needs
Review existing & ongoing efforts to identify informtion gaps
Decide on process for creating list of needs. Collect & document potential needs
Continue to identify& document potential needs
Continue to identify& document potential needs
Finish identifying potential needs
2. Define Science Plan objectives and alternative portfolio philosophies
a. Define Science Strategy objectives and portfolio level objectives
Define/discuss/ formulate SS objectives
Use objective to identify portfolio philosophies/goals
b. Develop alternative science portfolio strategies
Review philosophies, create illustr. strategies; process for alt strategies
3. Evaluate identified information gaps
a. Identify evaluation criteria and develop metrics
Review FY12 criteria; modify for long-term
Develop criteria and evaluation tool
Develop criteria and evaluation tool
b. Determine relative importance of each criterion
Develop criteria wgts if necessary
c. Conduct evaluation
Begin evaluating identfied needs
Continue evaluating identfied needs
Finalize evaluation
4. Solicit projects for addressing info gaps (description of process only)
Discuss annual process
ongoing work
Agree on description of annual process
5. Evaluate potential projects (description of process only)
Discuss annual process
ongoing work
Agree on description of annual process
6. Evaluate and recommend a science strategy
a. Create potential science plans by combining information priorities with portfolio philosophies
Create example portfolio; agree on process and begin full portfolio development
Continue porftolio development
Finalize portfolios
b. Compate alternative plans
Compare and evaluate strategies; select
c. Recommend to SC
Make recommendation
FY12
1. Identify potential information needs
a. Define decision support context
from Framing Wksp
b,c. Id information gaps and unmet or partially met needs
from Framing Wksp
2. Define Science Plan objectives and alternative portfolio philosophies
a. Define portfolio level objectives
from Framing Wksp
b. Develop alternative science portfolio strategies
from Framing Wksp
3. Evaluate identified information gaps
a. Identify evaluation criteria and develop metrics
from Framing Wksp
b. Determine relative importance of each criterion
from Framing Wksp
Consider relative resource
Consider relative resource

May meeting topics (5/8, 1:30-4:30 PDT)

- **FY12 priorities**
  - Status reports on all activities
  - Develop recommendations for SC on:
    - ***Data management platform***
    - ***Workshops/Symposiums to support***
- **Science strategy**
  - Review and “finalize” decision types and outcomes of interest
  - Information needs updates
    - ***Discuss and “finalize” activities to be undertaken to identify information needs***
    - ***Status of current activities / emerging list of needs***
    - ***Scale and scope of information needs an how they will be documented / summarized***
  - Evaluation/prioritization of needs
    - ***Discuss criteria for evaluating the importance of identified needs***
  - Strategy objectives and alternative philosophies
    - ***Set the stage for June in-person meeting***

June meeting topics (6/13-14, Portland)

- **Science strategy focused!**

- **Information needs prioritization**
  - Review current status of information needs identification
  - Conduct illustrative evaluation of some of the identified needs
  - Refine the evaluation process, define how the evaluation is to be conducted over the next couple of months
- **Portfolio / strategy definition**
  - Develop and describe alternative portfolio philosophies
  - Develop illustrative portfolios
  - Develop a process for continuing the portfolio development process
- **Define an annual planning process**
- **Agree on outline for the Science Strategy document**
  - Discuss writing assignments

Thanks!

- **Comments, concerns, questions can be sent to Frank, Mary, or Karen…**